

What is claimed is:

1           1. A metal vapor discharge lamp having an arc tube,  
2   wherein

3           the arc tube includes a container made of translucent  
4   ceramic, the container being divided into a main tube portion  
5   and two narrow tube portions respectively extending out from  
6   both ends of the main tube portion,

7           a discharge space is formed in the main tube portion with  
8   a light emission metal being enclosed in the discharge space,

9           an electrode is deposited in each narrow tube portion,  
10   a coil being wound around the electrode at an end thereof facing  
11   the discharge space,

12          an electrode supporting member is inserted in each narrow  
13   tube portion and connected to the other end of the electrode,

14          the arc tube is sealed by a sealing material that is inserted  
15   into each space between each electrode supporting member and  
16   each narrow tube portion, and

17          a length of each electrode is in a range of  $(0.041P + 0.5)$   
18   mm to  $(0.041P + 8.0)$  mm inclusive, wherein "P" represents a lamp  
19   power in watts.

1           2. The metal vapor discharge lamp of Claim 1, wherein  
2           a length of a portion of each electrode projecting from

3 each narrow tube portion into the discharge space is in a range  
4 of 3.0 mm to 6.5 mm inclusive.

1 3. The metal vapor discharge lamp of Claim 1, wherein  
2 each electrode has heat conductivity of no smaller than  
3 130 W/m\*K, and  
4 each electrode supporting member has heat conductivity  
5 of no larger than 100 W/m\*K.

1 4. The metal vapor discharge lamp of Claim 1, wherein  
2 each electrode contains tungsten and/or molybdenum, and  
3 each electrode supporting member contains cermet.

1 5. The metal vapor discharge lamp of Claim 1, wherein  
2 a length of each narrow tube portion is in a range of  $(0.032P$   
3  $+ 3.5)$  mm to  $(0.032P + 8.0)$  mm inclusive, wherein "P" represents  
4 a lamp power in watts.

1 6. The metal vapor discharge lamp of Claim 1, wherein  
2 the sealing material is inserted into each narrow tube  
3 portion from an outer end not facing the discharge space, and  
4 a length of the sealing material in each narrow tube portion  
5 is in a range of 3.7 mm to 5.5 mm inclusive.

1           7. The metal vapor discharge lamp of Claim 1, wherein  
2           the main tube portion and the narrow tube portions are  
3           formed in one piece.

1           8. A metal vapor discharge lamp having an arc tube, wherein  
2           the arc tube includes a container made of translucent  
3           ceramic, the container being divided into a main tube portion  
4           and two narrow tube portions respectively extending out from  
5           both ends of the main tube portion,

6           a discharge space is formed in the main tube portion with  
7           a light emission metal being enclosed in the discharge space,

8           an electrode is deposited in each narrow tube portion,  
9           a coil being wound around the electrode at an end thereof facing  
10          the discharge space,

11          an electrode supporting member is inserted in each narrow  
12          tube portion and connected to the other end of the electrode,

13          the arc tube is sealed by a sealing material that is inserted  
14          into each space between each electrode supporting member and  
15          each narrow tube portion,

16          a length of each electrode is in a range of  $(0.041P + 0.5)$   
17          mm to  $(0.041P + 8.0)$  mm inclusive, wherein "P" represents a lamp  
18          power in watts, and

19          the lamp power is in a range of 70 watts to 400 watts

20 inclusive.

1           9. A metal vapor discharge lamp having an arc tube, wherein  
2           the arc tube includes a container made of translucent  
3           ceramic, the container being divided into a main tube portion  
4           and two narrow tube portions respectively extending out from  
5           both ends of the main tube portion,  
6           a discharge space is formed in the main tube portion with  
7           a light emission metal being enclosed in the discharge space,  
8           an electrode is deposited in each narrow tube portion,  
9           a coil being wound around the electrode at an end thereof facing  
10          the discharge space,  
11          an electrode supporting member is inserted in each narrow  
12          tube portion and connected to the other end of the electrode,  
13          the arc tube is sealed by a sealing material that is inserted  
14          into each space between each electrode supporting member and  
15          each narrow tube portion, and  
16          a length of each narrow tube portion is in a range of  $(0.032P$   
17           $+ 3.5)$  mm to  $(0.032P + 8.0)$  mm inclusive, wherein "P" represents  
18          a lamp power in watts.

1           10. A metal vapor discharge lamp having an arc tube,  
2           wherein

3           the arc tube includes a container made of translucent  
4 ceramic, the container being divided into a main tube portion  
5 and two narrow tube portions respectively extending out from  
6 both ends of the main tube portion,

7           a discharge space is formed in the main tube portion with  
8 a light emission metal being enclosed in the discharge space,

9           an electrode is deposited in each narrow tube portion,  
10 a coil being wound around the electrode at an end thereof facing  
11 the discharge space,

12          an electrode supporting member is inserted in each narrow  
13 tube portion and connected to the other end of the electrode,

14          the arc tube is sealed by a sealing material that is inserted  
15 into each space between each electrode supporting member and  
16 each narrow tube portion, and

17 a length of each narrow tube portion is in a range of  $(0.032P$   
18  $+ 3.5)$  mm to  $(0.032P + 6.0)$  mm inclusive, wherein "P" represents  
19 a lamp power in watts.

1           11. The metal vapor discharge lamp of Claim 10, wherein  
2           the light emission metal enclosed in the main tube portion  
3 contains cerium.

1           12. The metal vapor discharge lamp of Claim 9, wherein

2 the sealing material is inserted into each narrow tube portion  
3 from an outer end not facing the discharge space, and a length  
4 of the sealing material in each narrow tube portion is in a range  
5 of 3.7 mm to 5.5 mm inclusive.

1 13. The metal vapor discharge lamp of Claim 9, wherein  
2 a thickness of each narrow tube portion is no smaller than 1.15  
3 times a thickness of the main tube portion.

1 14. The metal vapor discharge lamp of Claim 9, wherein  
2 each electrode supporting member is made of cermet.

1 15. The metal vapor discharge lamp of Claim 9, wherein  
2 the main tube portion and the narrow tube portions are  
3 formed in one piece.

1 16. The metal vapor discharge lamp of Claim 9, wherein  
2 the lamp power is in a range of 70 watts to 360 watts  
3 inclusive.

1 17. A lighting apparatus that includes a main body, a  
2 metal vapor discharge lamp disposed in the main body, and a  
3 lighting circuit apparatus connected to the metal vapor discharge

4 lamp, the metal vapor discharge lamp having an arc tube, wherein  
5 the arc tube includes a container made of translucent  
6 ceramic, the container being divided into a main tube portion  
7 and two narrow tube portions respectively extending out from  
8 both ends of the main tube portion,

9 a discharge space is formed in the main tube portion with  
10 a light emission metal being enclosed in the discharge space,

11 an electrode is deposited in each narrow tube portion,  
12 a coil being wound around the electrode at an end thereof facing  
13 the discharge space,

14 an electrode supporting member is inserted in each narrow  
15 tube portion and connected to the other end of the electrode,

16 the arc tube is sealed by a sealing material that is inserted  
17 into each space between each electrode supporting member and  
18 each narrow tube portion, and

19 a length of each electrode is in a range of  $(0.041P + 0.5)$   
20 mm to  $(0.041P + 8.0)$  mm inclusive, wherein "P" represents a lamp  
21 power in watts.

1 18. A lighting apparatus that includes a main body, a  
2 metal vapor discharge lamp disposed in the main body, and a  
3 lighting circuit apparatus connected to the metal vapor discharge  
4 lamp, the metal vapor discharge lamp having an arc tube, wherein

5           the arc tube includes a container made of translucent  
6 ceramic, the container being divided into a main tube portion  
7 and two narrow tube portions respectively extending out from  
8 both ends of the main tube portion,

9           a discharge space is formed in the main tube portion with  
10 a light emission metal being enclosed in the discharge space,

11          an electrode is deposited in each narrow tube portion,  
12 a coil being wound around the electrode at an end thereof facing  
13 the discharge space,

14          an electrode supporting member is inserted in each narrow  
15 tube portion and connected to the other end of the electrode,

16          the arc tube is sealed by a sealing material that is inserted  
17 into each space between each electrode supporting member and  
18 each narrow tube portion, and

19          a length of each narrow tube portion is in a range of  $(0.032P$   
20  $+ 3.5)$  mm to  $(0.032P + 8.0)$  mm inclusive, wherein "P" represents  
21 a lamp power in watts.